

COMPONENTS

FAQ

Q Is it worth upgrading to DDR3 memory now?

A DDR3 has faster transfer rates than current DDR2 memory. The current batch runs at 1,066MHz, and future DIMMs will run as fast as 1,333MHz. That said, DDR3 has higher latency than DDR2, so accessing the first chunk of data is slower. The type of task you're running, then, really defines whether DDR3 is quicker than DDR2.

To get the most out of DDR3's higher transfer rates you need a processor with a faster frontside bus speed, such as Intel's latest models (those whose model numbers end in 50), in order to run the memory synchronously at full speed.

DDR3 memory is also around three times the price of DDR2, so it's an expensive upgrade. The situation we're in now is similar to when DDR2 was first introduced and DDR was pretty much as quick. For the time being, we'd stick with DDR2 and wait until DDR3 prices fall before upgrading.

David Ludlow
Deputy Editor

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AOPEN Aeolus G325

★★★★★
£50 inc VAT

If you like the idea of a mini barebones PC but still want the flexibility of choosing your own components and motherboard, AOpen's Aeolus G325 may be of interest. It takes a standard microATX motherboard and is a touch wider than one of Shuttle's barebones PCs, but is still considerably smaller than a regular PC case. As there's no motherboard provided, you get to choose exactly what you want to put inside the case, including whether you want an Intel or AMD processor.

We like the case's slightly bulbous appearance and the handles that decorate the top. These are only for show, though, and a sticker on top warns you not to try and lift the case using the handles, as they can't bear the weight of a loaded case.

Building the case is slightly trickier than you may first expect. To get everything in, you first need to remove all the drive bays and the front panel. Perhaps the strangest thing about the G325 is that the power supply hangs out of the back and is screwed into a mounting bracket. There's not much room to manoeuvre the power supply, so it's a real fiddle to get it attached. Once in place, a plastic cover screws into the mount and hides the power supply from view, leaving just the power socket exposed. With the case assembled, you'll never notice the protruding supply. The main benefit of this design is that you can fit a full-sized, powerful supply in the G325, and you're not limited to the lower-rated supplies that Shuttle uses inside its mini PCs.

There's not much room to work inside the case, and you have to be careful inserting a motherboard through the side of the case. Even being really careful, it's easy to scrape the board accidentally against a metal support, which could cause damage. We'd recommend taking this step as slowly as possible to avoid problems later on.

SUMMARY

- ✓ Looks great
- ✓ Lots of room for drives
- ✗ Fiddly to build

MICROATX CASE Three 3½ drive bays (two internal, one external), 1x 5¼in drive bay, 2x USB2, FireWire, audio in, audio out
PART CODE 91.90620.A260
SUPPLIER www.amazon.co.uk
DETAILS www.aopen.com



Once inside the case, there's plenty of room to get the motherboard in place and secured using screws. The motherboard has a fair amount of room above it, so cooling the processor shouldn't be a problem. You should be able to fit all but the largest of processor coolers without any trouble.

There's a surprising amount of room for drives, with two 3½in internal drive bays for hard disks, an external 3½in drive bay for a memory card reader, floppy disk or another hard disk, and a 5¼in drive bay for an optical drive. This is hidden by a flap, so you don't need to find a drive with a coloured bezel to match the G325. There are four blanking plates for expansion cards, which are held in place with a screwless mount, so fitting them is easy.

As you'd expect from a modern case, there are two front-mounted USB2 ports, FireWire and audio-in and -out ports. These are covered with a flap, too, which keeps your case looking good when you don't have any peripherals connected.

The Aeolus G325 feels very sturdy, and the case didn't rattle or move in our tests, so it's a good basis for building a quiet computer. Its looks might not be to everyone's tastes and it's not as small as a Shuttle barebones PC, but it's still small and its flexibility makes it a good choice for anyone who wants to choose every component of their mini PC.

David Ludlow

Also consider...

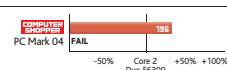
INTEL Core 2 Duo E6700

★★★★★
£194 inc VAT

BEST BUY Intel's new processor is based on the company's mobile technology. It is designed to be much more efficient than the P4. It's incredibly quick, achieving some of the highest benchmark results we've ever seen. You'll need a new Intel 965 or 975-based motherboard to use the E6700, but it's worth every penny, as it's by far the best-value processor you can buy.



PROCESSOR Two cores running at 2.66GHz, LGA775, 267MHz external bus, 4MB L2 cache
PART CODE BX805576700
SUPPLIER www.ebuyer.com
DETAILS www.intel.com
✓ Extremely fast; great value
FULL REVIEW Oct 2006



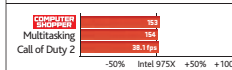
GIGABYTE GA-965P-DS3P (Rev 3.3)

★★★★★
£77 inc VAT

BEST BUY This motherboard uses Intel's P965 chipset, but it's been modified to take processors with a 1,333MHz frontside bus. It uses solid-state capacitors, so should be more reliable than those that use fluid-electrolyte ones. Performance was excellent, and there's even support for CrossFire. It's a great board at a great price.



INTEL MOTHERBOARD P965 chipset, supports socket LGA775 processors, 2x PCI, 2x PCI x1, 2x PCI-E x16, 4x DIMM slots, Gigabit Ethernet, 4x USB2, FireWire
PART CODE GA-965P-DS3P
SUPPLIER www.scan.co.uk
DETAILS www.gigabyte.com.tw
✓ Excellent performance; supports 1,333MHz frontside bus processor
FULL REVIEW Aug 2007



INTEL

Core 2 Extreme QX6850

★★★★★

£600 inc VAT



Intel's Core 2 Extreme QX6850 is the latest addition to the company's quad-core processor range. As with previous processors, it's best to think of the QX6850 as two Core 2 Duo processors on the same chip for a total of four cores. Each pair of cores has 4MB of shared L2 cache. This memory is intelligent, so if one core isn't doing anything, the other core has full access to it. Both cores can also share the data in the cache, so if they're both after the same bit of information, it only needs to be loaded into the cache once.

As with other processors in the Extreme range, the QX6850 is not multiplier locked, so it's simple to overclock without having to adjust bus speeds. The big difference between the QX6850 and previous quad-core processors is its clock speed: it has a 1,333MHz

frontside bus (FSB) and clock speed of 3GHz, making it the fastest Core 2 processor available. It stormed through our benchmark tests, achieving the highest score we've ever seen.

The QX6850 is expensive but, incredibly, it costs the same as the current Core 2 Extreme QX6700 processor, although you'll need to include the price of a new motherboard that supports the faster FSB speed. If you're building a new PC and want the absolute best, then this is it. Those on a more realistic budget should opt for the Core 2 Duo E6750 (see page 52).

David Ludlow



SUMMARY

- ✓ The fastest processor we've seen
- ✓ Same price as old quad-core chip
- ✗ Still expensive

PROCESSOR Four cores running at 3GHz, LGA775, 333MHz external bus (1,333MHz quad-pumped FSB), 2x 4MB L2 cache

PART CODE TBC

SUPPLIER www.lambda-tek.comDETAILS www.intel.com

PERFORMANCE (see page 62)

GIGABYTE
GA-P35T-DQ6

★★★

£132 inc VAT

Gigabyte's GA-P35T-DQ6 is the first motherboard we've reviewed to use DDR3 memory, which is capable of higher clock speeds than current DDR2 modules. The GA-P35T-DQ6 can take memory up to 1,333MHz, which matches the front side bus (FSB) speed of Intel's new processors. With none of this memory available, we tested with DDR3 1,066MHz memory instead. We got marginally better performance, particularly in our multitasking test, but DDR3 currently isn't significantly better than DDR2 and it's around three times the cost (see FAQ, left).

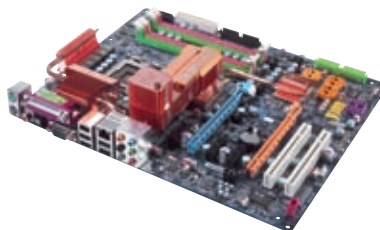
The board takes all Intel's LGA775 processors, including the new Core 2 Duo and Core 2 Extreme processors that we've also reviewed in this section.

Installing the GA-P35T-DQ6 could prove to be a pain, as the three heatsinks surrounding the processor socket get in the way. We had trouble getting a reference Intel cooler to fit, and it would be impossible to fit some larger coolers. The heatsinks also get in the way of the top PCI-E x1 slot, making it difficult to install anything but the shortest of cards.

Strangely, there are parallel and serial ports on the back panel, but no eSATA. This seems a strange choice.

Gigabyte's GA-P35T-DQ6 isn't a bad board and its performance was excellent. But the huge heatsinks and current high price of DDR3 mean that Asus's P5K Deluxe/WiFi-AP (see below) is a much better choice.

David Ludlow



SUMMARY

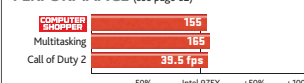
- ✓ Takes the latest processors
- ✗ Heatsinks get in the way
- ✗ Legacy ports but no eSATA

INTEL MOTHERBOARD Intel P35 chipset, supports Intel LGA775 processors, 2x PCI, 3x PCI-E x1, 2x PCI-E x16 (one runs at x4 speed), 4x DDR3 DIMM slots, 4x USB2, Gigabit Ethernet, FireWire, 8x SATA2

PART CODE GA-P35T-DQ6

SUPPLIER www.scan.co.ukDETAILS www.gigabyte.com.tw

PERFORMANCE (see page 62)

MSI
K9AGM2

★★★★★

£37 inc VAT



MSI's K9AGM2 is the best-value motherboard if you want to build a media centre PC. It's a microATX board,

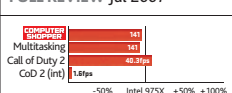
so it will fit in a suitably attractive and small case. It's also got all the outputs that you'll need built in, including an HDMI output for connecting to an LCD TV. Its performance was very good. This motherboard is an absolute bargain.



AMD MOTHERBOARD AMD 690G chipset, supports AMD Socket AM2 processors, 1x PCI slot, 1x PCI-E x1 slot, 1x PCI-E x16 slot, 2x DIMM slots, 1x Gigabit Ethernet, 4x USB2 ports, HDMI PART CODE K9AGM2 SUPPLIER www.lambda-tek.com

- ✓ Excellent value; HDMI output
- ✗ Only two memory slots

FULL REVIEW Jul 2007

SHUTTLE
XPC SD32G2

★★★★★

£188 inc VAT

PRICE CUT!



The SD32G2 looks smart, but you'll need an optical drive with a silver bezel to

avoid spoiling its looks. It's easy to build thanks to the detailed instructions. Performance was excellent in our 2D tests, near the top of the recent Labs test. With support for Core 2 Duo processors, it's an excellent barebones kit.

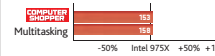


BAREBONES PC LGA775 processor socket, 2x DDR2 533/667 DIMM slots, Intel 945G graphics, 1x PCI-E x16, 2x SATA ports, 10/100/1,000 network, 6x USB2, 2x FireWire, 7.1 audio, 1x 5¼in bays, 2x 3½in bays PART CODE SD32G2 SUPPLIER www.ebuyer.com

DETAILS www.shuttle.com

- ✓ Plenty of room inside case; easy to assemble

FULL REVIEW Apr 2007

ASUS
P5K Deluxe/WiFi-AP

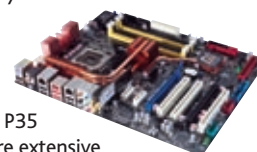
★★★★★

£142 inc VAT



The P5K Deluxe uses Intel's new P35 chipset. There are extensive

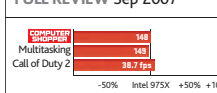
overclocking options, too, so you can push your processor to the limit. Other features include CrossFire support, built-in WiFi and dual Gigabit Ethernet ports. It's expensive, but a good choice if you want to build a powerful PC.



INTEL MOTHERBOARD Intel P35 chipset, supports socket LGA775 processors, 3x PCI, 2x PCI-E x1, 2x PCI-E x16, 4x DDR2 DIMM slots, 2x Gigabit Ethernet, 6x USB2, FireWire, 802.11g wireless adaptor PART CODE P5K Deluxe/WiFi-AP SUPPLIER www.scan.co.uk

DETAILS <http://uk.asus.com>

FULL REVIEW Sep 2007





INTEL Core 2 Duo E6750

★★★★★

£117 inc VAT



It's been just over a year since we reviewed Intel's first incarnation of its Core 2 Duo processor range. The Core 2 Duo E6750 is the latest update. It is part of the Conroe family, like the previous desktop models, and has the same 2.66GHz core speed as its predecessor, the Core 2 Duo E6700 (see 'Also consider...' on page 50).

However, while the previous generation of chips ran with a frontside bus (FSB) of 1,066MHz, the E6750 runs with a 1,333MHz FSB. You'll need a motherboard that supports this increased speed, including any Intel P35-based motherboard, such as Asus's P5K/WiFi-AP (see 'Also consider...'). The increased bus helps speed up communication between the processor and other system components, such as memory. It's particularly important with the launch of DDR3, as the Core 2 Duo E6750 can run 1,333MHz memory at full bandwidth.

Other than the FSB increase, the Core 2 Duo E6750 is no different to the previous generation of processors. It has the same 4MB of shared L2 cache, 14-step pipeline and Smart memory access, so data can be loaded into the cache before it's needed. Impressively, the E6750 still has the same 65W Thermal Design Power (TDP), so it runs really cool.

With the FSB being the main change, then, the E6750 is a touch faster than the E6700, so it's still an amazingly fast processor. The astonishing thing is the price: the E6750 is £77 cheaper than the E6700 and only £21 more expensive than the E6320.

The only slightly disappointing thing is that it needs a new motherboard, so overall it will work out marginally cheaper for upgraders with older LGA775 motherboards to buy the E6700. For anyone building a new PC, though, the E6750 has it all: performance and a price that screams "buy me".

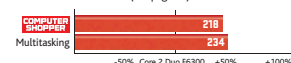
David Ludlow

SUMMARY

- ✓ Incredible value
- ✓ Amazing performance
- ✗ Needs a new motherboard

PROCESSOR Two cores running at 2.66GHz, LGA775, 333MHz external bus (1,333MHz quad-pumped FSB), 4MB L2 cache
PART CODE BX80557
SUPPLIER www.lamba-tek.com
DETAILS www.intel.com

PERFORMANCE (see page 62)



ECS G33T-M2

★★★

£50 inc VAT

ECS's G33T-M2 uses Intel's budget G33 chipset, which has integrated GMA3100 graphics – the company's latest 3D graphics chipset. It supports processors with a 1,333MHz frontside bus (FSB), such as the Core 2 Duo E6750 (reviewed left). There are some overclocking options in the BIOS, but they don't have the breadth of those offered by Asus's P5K Deluxe/WiFi-AP (see 'Also consider...' page 51).

ECS has opted for four DDR2 DIMM slots. This makes sense, as DDR2's performance is similar to the current DDR3 memory and is around a third of the price.

Strangely, there's no PATA interface, so you'll need to buy a SATA DVD drive or a PATA-to-SATA converter. It's the first board we've seen to ditch this popular interface and it's a strange move on a budget motherboard.

Windows Vista's Aero Glass interface worked straight away on the integrated graphics. We ran into problems when we tried to run our Call of Duty 2 test, as it quit with a DirectX error. Installing the latest drivers from ECS and Intel failed to fix the problem.

After installing an INF update we got 3DMark06 to work, although the tests were very jerky and there was no HDR support. We had a little more success with Prey, although the frame rate of 5.8fps at 1,280x1,024 with no AA shows that these graphics aren't really suitable for gaming. Fortunately, there's a PCI-E x16 slot, so you can upgrade to a better card.

We were quite disappointed by the G33T-M2's onboard graphics and the poor driver support, which we hope will improve. However, if you're looking for a cheap motherboard for the latest Intel processors, it's good value; just see this month's *Labs* for a graphics update.

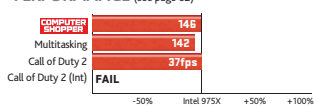
David Ludlow

SUMMARY

- ✓ Supports the latest Intel processors
- ✓ Good value
- ✗ Poor graphics drivers

INTEL MOTHERBOARD Intel G33 chipset, supports Intel LGA775 processors, 2x PCI, 1x PCI-E x1, 1x PCI-E x16, 4x DDR DIMM slots, 4x USB2, Gigabit Ethernet, GMA3100 integrated graphics
PART CODE G33T-M2
SUPPLIER www.scan.co.uk
DETAILS www.ecs.com.tw

PERFORMANCE (see page 62)



CHOOSING A... Barebones System

Follow the steps to find your ideal specs

PROCESSOR SUPPORT: AMD Socket AM2

HARD DISK SUPPORT: 2x SATA

EXPANSION SLOTS: 2x PCI

GRAPHICS: Onboard

EXTRAS: Memory card reader

Recommended minimum in grey

1 Buying a barebones system is a simple way of building your own computer, as you get a case with the motherboard already installed, plus all of the cables and instructions are designed specifically for your PC. All you need to do is add your own drives, processor, memory and, potentially, graphics card. A barebones system that supports the latest AMD Socket AM2 processors and has space for up to two hard disks and an optical drive will cost around £130.

2 As the motherboard is built in, you need to decide on the processor you want to buy before you choose your barebones case. If you want Intel support, you'll need an LGA775 socket. Check for Core 2 Duo support on the manufacturer's website if you want to use Intel's latest processors. For AMD systems, Socket 939 will support the older range of processors, which are good value now but harder to upgrade from; Socket AM2 will support all AMD's new processors.

3 If you just want a basic computer for office tasks, onboard graphics will save you money. If you want the option to upgrade to a dedicated graphics card to play games, look for a system that comes with a PCI-E x16 slot.

4 If you want to be able to install a wireless card, TV card or other expansion card, you'll need a system with free expansion slots. For now, make sure you get at least one PCI slot; PCI-E x1 slots aren't as well supported and you'll have more trouble buying a card to fit them.

5 How are you going to use your PC? If it's a second PC, a standard tower barebones will do the job. If space is at a premium, a mini PC is a more sensible option. If you're building for the living room, a barebones with hi-fi styling makes more sense. Whatever your choice, make sure there's enough room to fit all the hard disks, optical drives and expansion cards you want.